

DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
OFFICE OF STANDARDS SERVICES

COMMERCIAL STANDARD CS203-56

FLAME-RESISTANT PAPER AND PAPERBOARD

Commercial Standard CS203-56, Flame-Resistant Paper and Paperboard, was superseded by Product Standard PS46-71 by the same title.

PS46-71, Flame-Resistant Paper and Paperboard, was withdrawn by the Department of Commerce in 1982. PS46-71 was replaced by American National Standards Institute/Technical Association of the Pulp and Paper Industry (ANSI/TAPPI) Standard T461 OM-84, Flame Resistance of Treated Paper and Paperboard.

For technical assistance and standards information, contact:

Technical Association of the Pulp and Paper Industry (TAPPI)
15 Technology Parkway South, P.O. Box 105113
Norcross, Georgia 30092, USA
Telephone: (404) 446-1400
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American Paper Institute (API) was the sponsor of PS46-71 and can provide additional information.

Contact: American Paper Institute (API)
260 Madison Avenue, 10th Floor
New York, New York 10016, USA
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WITHDRAWN

FLAME-RESISTANT PAPER AND PAPERBOARD

TS-5302

COMMERCIAL STANDARD CS203-56

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1. PURPOSE

1.1 The purpose of this Commercial Standard is to reduce danger of personal injury and loss of property by providing, on a national basis, a standard method of testing and rating flame-resistant paper and paperboard.

2. SCOPE

2.1 The standard provides a method of testing and rating the flame-resistance of all types of papers and paperboards, not over 0.020 inch thick, that have been treated to prevent the spread of flame when ignited. It also provides a means of identification of quality.

3. DEFINITIONS

3.1 Flaming time is the time the specimen continues to flame after the burner flame is removed from the specimen. (See pars. 5.3.2 and 5.3.3.)

3.2 Glowing time is the time the specimen continues to glow after it has ceased to flame. (See pars. 5.3.2 and 5.3.3.)

3.3 Char length^{1/} is the average maximum height of the charred or burned areas in inches, measured from the bottom edge of the piece to the nearest 1/8 or 0.1 inch. Areas of soot deposition from the flame of the test burner shall not be considered in evaluating the char length.

3.4 Unit of product shall be a roll, carton, skid, or bundle.

3.5 Maximum flaming time shall be the highest average value obtained on any unit of product.

3.6 Maximum glowing time shall be the highest average value obtained on any unit of product.

3.7 Maximum char length shall be the highest average value obtained on any unit of product.

3.8 Average flaming time shall be the average of the flaming results obtained from all specimens tested.

^{1/} Described in TAPPI Standards, T461m-48, issued by Technical Association of the Pulp and Paper Industry, 155 East 44th St., New York 17, N. Y.

3.9 Average glowing time shall be the average of the glowing results obtained from all specimens tested.

3.10 Average char length shall be the average of the char length obtained from all specimens tested.

4. REQUIREMENTS

4.1 Flame-resistant paper and paperboard.--Paper or paperboard which, when tested in accordance with Section 5 of this standard, meets the following requirements, shall be considered flame-resistant:

Flaming time		Glowing time		Char length	
Average	Maximum	Average	Maximum	Average	Maximum
<u>Seconds</u>	<u>Seconds</u>	<u>Seconds</u>	<u>Seconds</u>	<u>Inches</u>	<u>Inches</u>
2.0	2.5	2.0	5.0	4.5	5.5

5. METHOD OF TEST

5.1 Apparatus.--See Method 5902, Federal Specification CCC-T-191b.

5.1.1 Sheet metal cabinet 12 to 14 inches wide, 12 to 14 inches deep, and 30 inches high, provided with a door containing a glass inset for observing the burning specimen. The top closure shall contain a baffled vent. There shall be baffled holes or similar means of ventilation near the bottom of the shield, as shown in figure 1.

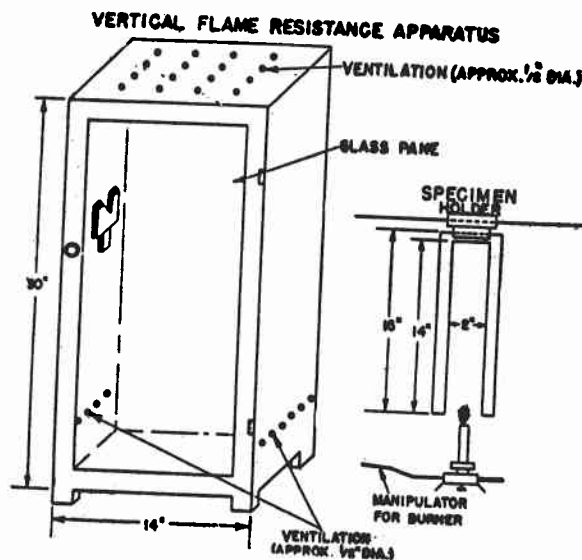


Figure 1.

5.1.2 Metal specimen holder which clamps each long edge of the specimen, leaving a center strip 2 inches wide exposed and without enclosure across the lower end. The specimen holder shall be supported in such a manner that the specimen is suspended vertically over the flame.

5.1.3 Bunsen or Tirrill gas burner with a tube $3/8$ inch inside diameter and 6 inches in height from the top of the tube to the floor of the cabinet. The burner shall be equipped with a pilot attachment for lighting the test flame, or a manipulating bar to move the lighted burner into test position.

5.1.3.1 If the burner is equipped with a pilot attachment, a handle or other suitable device should be provided outside the cabinet to operate a quick release valve that will permit the flame to be turned on or off while the burner is fixed in a permanent position.

5.1.3.2 If a manipulating bar is provided it shall be secured to the base of the burner and extend outside of the cabinet through a slot in one side, to provide a means of manipulating the burner without opening the cabinet.

5.1.4 Stop watch or other device accurate to $1/5$ second.

5.2 Sampling and test specimens.--

5.2.1 Sampling^{2/}--Unless otherwise specified, sampling shall conform to the following:

5.2.1.1 Size of sample.--The specimens comprising the sample shall be so selected as to be representative of the entire lot of paper. Not less than 5 or more than 20 sets of specimens, comprising one set from each unit, shall be taken as follows:

<u>Total units in shipment</u>	<u>Units to be sampled</u>
Less than 100	5
100 to 399	5 to 20 ^{1/}
400 or more	20

^{1/} That is, 5 percent of the total number of units in the shipment is to be sampled.

5.2.1.2 Method of sampling.--

(a) In the case of rolls, care shall be taken to select sheets that are not damaged. It is good practice to discard the first three layers of the roll to be sure of obtaining a unit sample in good representative condition. The specimens shall be cut from sheets taken across the full width of several unharmed layers.

^{2/} In accordance with ASTM Designation D585-42, Method of Sampling Paper and Paper Products, of the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

(b) In the case of sheet-cut paper, specimens shall be cut from at least five consecutive sheets taken from a point or points over 1/2 inch from the top or bottom of each case, frame, skid, or bundle.

(c) The specimens shall be trimmed with their edges exactly parallel to the machine and cross directions of the paper.

(d) A sufficient number of specimens from each unit sampled shall then be arranged consecutively in rotation to form a representative sample.

5.2.2 Test specimens.--Three specimens in each principal direction (machine and cross) of the sheet or board shall be tested from each unit of product sampled. The specimens shall be rectangles of paper or paperboard 2 3/4 inches wide and 12 inches long.

5.2.2.1 The dry test specimens shall be conditioned in accordance with the TAPPI method under standard conditions of 50-percent relative humidity and 73° F temperature.

5.2.2.2 In preparing specimens from creped or pleated papers, the samples shall be stretched by suitable means to a substantially flat form (i.e., containing 10 percent or less stretch) before cutting specimens to the prescribed dimensions for testing.

5.3 Flame test.--

5.3.1 The specimen, conditioned as described in par. 5.2.2.1, shall be suspended vertically in the cabinet in such a manner that a 12-inch length of the specimen is exposed and the lower end is 3/4 inch above the top of the gas burner.

5.3.2 The gas supply of the burner shall be adjusted to give a luminous flame 1 1/2 inches in height with the air supply completely shut off. The door of the cabinet shall be closed and the test flame ignited from the pilot light or the lighted burner moved under the center of the lower end of the specimen by means of the manipulating bar. The flame shall be applied vertically near the middle of the lower end of the specimen for a period of 12 seconds and then withdrawn.

5.3.3 The flaming time and glowing time of the specimen shall be recorded to the nearest 1/5 second.

5.3.4 The char length of the specimen shall be recorded to the nearest 1/8 or 0.1 inch.

5.4 Report.--The following values shall be reported:

1. Maximum flaming time to the nearest $1/5$ second.
2. Maximum glowing time to the nearest $1/5$ second.
3. Maximum char length to the nearest $1/4$ inch.
4. Average flaming time to the nearest $1/5$ second.
5. Average glowing time to the nearest $1/5$ second.
6. Average char length to the nearest $1/4$ inch.

6. IDENTIFICATION

6.1 In order that purchasers may be assured that flame-resistant paper and paperboard purchased actually comply with all requirements of this Commercial Standard, it is recommended that manufacturers include the following statement in conjunction with their name and address on labels, invoices, sales literature, etc.:

This flame-resistant paper (or paperboard) complies with all requirements of Commercial Standard CS203-56, as developed by the trade under the procedure of the Commodity Standards Division, and issued by the U. S. Department of Commerce.

ACCEPTANCE OF COMMERCIAL STANDARD

If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this Commercial Standard.

Date

Commodity Standards Division
Office of Technical Services
U. S. Department of Commerce
Washington 25, D. C.

Gentlemen:

We believe that this Commercial Standard constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable in the

production 1/ distribution 1/ purchase 1/ testing 1/

of flame-resistant paper and paperboard. We reserve the right to depart from it as we deem advisable.

We understand, of course, that only those products which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

Please send us a printed copy of the standard when available.

Signature of
Authorized Officer _____
(In Ink)

(Kindly typewrite or print the following lines)

Name and title of above officer

Organization
(Fill in exactly as it should be listed in pamphlet)

Street address

City, Zone and State

1/ Underscore the one that applies. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade associations, trade papers, etc., desiring to record their general support, the words "General Support" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. Enforcement.--Commercial Standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer, and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. The acceptor's responsibility.--The purpose of Commercial Standards is to establish for specific commodities, nationally recognized grades or consumer criteria and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard, and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the Commercial Standard where practicable, in the production, distribution, or consumption of the article in question.

3. The Department's responsibility.--The major function performed by the Department of Commerce in the voluntary establishment of Commercial Standards on a nation-wide basis is fourfold: first, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. Announcement and promulgation.--When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active, valid opposition, the success of the project is announced. If, however, in the opinion of the Standing Committee or the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

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